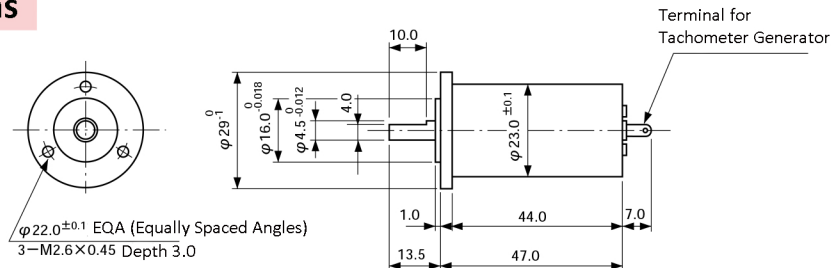


φ23 Series



- Ultra-small, high performance, and high reliability.
- Using Samarium-based rare earth magnet.
- The ripples of output voltage are small and superior in linearity for using moving coil armature.

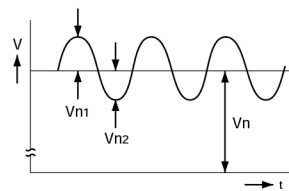
External Dimensions



Specifications

Item	Unit	TG-234401P	TG-234402P
Output Voltage	V/1000rpm	3±10%	6±10%
Linearity	%	0.2max	
Ripple P-P Value (Test Circuit)	%	5max	
Ripple RMS	%	0.5max	
Ripple Frequency	Cycle/Rev	11	
Directional Difference	%max	5	0.5
Armature Resistance	Ω	90	280
Inductance	mH	0.8	3.3
Armature Inertia	g·cm ²	2.0	
Friction Torque	gf·cm	20	
Generated Voltage Temperature Coefficient	%/°C	-0.03	
Insulation Resistance	MΩ	10 (min)	
Ambient Temperature	°C	-10~+60	
Maximum Armature Winding Temperature	°C	130	
Speed Range	rpm	7000	
Thrust Gap	mm	0.025~0.1	
Radial Gap	mm max.	0.038	
Shaft Vibration (T.I.R.)	mm max.	0.05	
Weight	g	110	

Measuring Methods



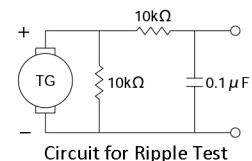
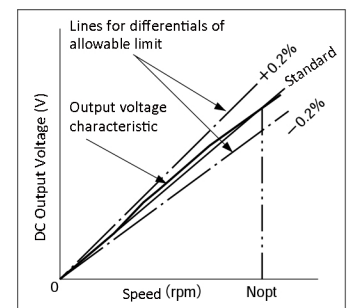
$$\text{Linearity} = \frac{V_n - (n/1000) \times V_{1000}}{(n/1000) \times V_{1000}} \times 100 (\%)$$

$$\text{Ripple P-P} = \frac{\text{Ripple P-P Value}}{\text{Generated Voltage}} \times 100 (\%)$$

$$\text{Ripple rms} = \frac{\text{Ripple rms Value}}{\text{Generated Voltage}} \times 100 (\%)$$

$$\text{Differential of } V_{cw} = \frac{V_{ccw} - V_{cw}}{V_{ccw}} \times 100 (\%)$$

V_n : Generated Voltage at n rpm
V₁₀₀₀ : Generated Voltage at 1,000 rpm
Ripple P-P : V_{n1} + V_{n2} as shown above
Ripple rms : Effective value for AC of generated voltage
V_{ccw} : Generated Voltage at 1,000 rpm ccw
V_{cw} : Generated Voltage at 1,000 rpm cw



Output Waveforms for Tachometer Generator

This product uses Samarium-based rare earth magnet for field magnetic flux source and it keeps to generate high magnetic flux constantly and stably. The coil generates alternating current (AC) by driving Moving Coil-Type Rotor but since the commutator rectifies the voltage and outputs it by converting to direct current (DC) through a brush, output waveforms would be as shown in [Drawing-A] ideally.

However, because of the effect by reactance voltage of rotor's inductance, contact resistance of the brush, and field magnetic flux distribution range, actual waveforms will be as shown in the picture left.

Abnormal Waveforms

The normal waveforms of DC output voltage should be as shown in [Diagram-A] ideally. However, the actual waveforms would be collapsed when brushes pass through insulating parts on the commutator and therefore contact state would be changed momentarily as shown in the picture left in middle. In an extreme case, the waveforms would be abnormal as shown in [Diagram-B] by brushes contact failure.

It is possible to reduce those abnormal waveforms by making the outputs pass through the filter and especially it is important to reduce them to utmost limit if using our product to a controlling application with fast response.

The brushes and commutator of this product are very stable, have low contact resistance, and excellent abrasion resistance. By combining with the excellent characteristics of Moving Coil Type, this will make control stable no matter how long it operates. Especially for the low speed range where effect of ripples increases, it will show superior performance.

